

# ESP for Chemistry and Microbiology: An Integrated Approach

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By Elisabetta Nucifora

Teaching ESP English for chemistry and microbiology can be a frightening experience for many teachers. Everybody is used to ESP for literature or business. There are textbooks and vintage materials ready to offer a step-by-step guide to the most experienced as well as to the most unskilled teacher. Motivations for the study of business English or English for literature have been analysed extensively, but what about English for sciences? Who is supposed to study it and to what extent? What are science students supposed to learn and what are they expected to do once they have grown familiar with ESP English? And where are the textbooks and the material that should make teaching possible in the class? Many of these questions are left largely unanswered despite the presence of regular ESP syllabi in Italian secondary school classes of "Istituti Professionali."

Upon a closer inspection, additional obstacles will appear for the unfortunate teacher who is in charge of a class of future chemists or biologists. Firstly, English teachers usually are not familiar with the subject matter of chemistry or biology, and some of them may even discover that they have always hated such subjects. Secondly, a crash course in these subjects would not be realistically possible. Additionally, students are often on bad terms with these subjects, thus the very idea of having to deal with them in English may add a negative factor which will hinder their learning from the start. Thirdly, it is often taken for granted that ESP English is not going to lead to anything important so it's no use trying. In other words, expectations are usually (and sometimes deliberately) kept very low.

Therefore, in order to get results in ESP English for sciences it is necessary to highlight specific objectives. If the main question is, "Why do secondary school students have to study English for science?", a possible and sensible answer can be, "Because they will need English in ordinary and professional communication." Ordinary communication should not disappear, but rather, should encompass professional microlanguage:

<b>Standard English for ordinary communication</b>
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<b>ESP Chemistry and Microbiology</b>
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The second relevant question is, of course: "How do I achieve all that?" The answer is in what I call "the integrated approach." The idea of *integration* does not only come from the familiar view of *integrated skills* which are still there. It is a consequence of lesson planning in modules that

have as their center a topic of wide interest (but not necessarily scientific) in which a specific scientific section is carved out. (See diagram above.)

The advantages of this approach are many and invaluable:

1. The integrated approach doesn't separate communication in chunks. Rather it obliges both teachers and students to keep the standard and the professional side of English together. The student who knows the appropriate terminology for the most complex chemical plant, but is unable to give directions on a map to locate that same plant because "he only knows technical English", will become a thing of the past.
2. The integrated approach relieves the sense of frustration of the unhappy teacher who, basically unaware of professional subjects, realizes s/he can introduce concepts, ideas, and notions s/he is definitely more familiar with, without being unfair to his/her students.
3. The integrated approach is flexible enough to suffer restrictions or expansions in keeping with the students' needs or with an event that might turn up during the school term. Additionally, it can be supplemented with a variety of materials.

A practical example will do. Last year in a fifth grade class of *operatore tecnico chimico* our programme included a module that we called "From *Frankenstein* to *Jurassic Park* ." The main topic was obviously bioethics. I chose this theme, partly on the spur of the moment, because of the frequent inputs we were receiving from the media, and also because I thought it might be fascinating for the students to debate such hot subjects. The theme of man who wants to force nature into his own projects is what I call an *evergreen* and I precisely wanted the students to think of this as an issue that frequently comes up in our civilisation.

## Materials

1. Two articles from *Time-Life Magazine* related to in vitro fertilisation.
2. One article from an Italian paper *La Repubblica* on the same topic.
3. The video *Jurassic Park* in Italian, (The debate that followed however, was carried out in English).
4. The beginning of Chapter V from *Frankenstein* by Mary Shelley in which the birth of the "creature" occurs.

Activities in the class took nine hours. I planned the whole micro-unit as follows:

**Preparatory activities:** Introducing the main topic to the class: What did they know about test tube babies? Is it possible to create a living being in the lab? And if yes, how legitimate can this process be? Presentation of the basic vocabulary including STANDARD lexis such as creation, love, pride, and of SCIENTIFIC lexis such as embryo, test tube, cell, clone. A preparatory debate in the class turned out to be very stimulating. The students were asked to say whether they would

undergo in vitro fertilisation or IVF, if some day they would discover they couldn't have any children naturally. The boys turned out to be more conservative. They absolutely refused to undergo such procedures. Some girls, on the contrary, were favourable.

**Main activities:** These included the intensive reading of the chosen texts. The reading of *Frankenstein* was done on the same day as the presentation of *Jurassic Park*. First, we concentrated on the dramatic description of the birth of the monster, stressing all the linguistic devices used by the authoress who cast a gloomy light on the event. Then we watched the sequences of *Jurassic Park* which dealt with the birth of the "raptors". The students were stunned: They couldn't miss the connections between past and present. A hot discussion followed. The class was soon divided into two parties, one supporting the view that science must go on at all costs, the other maintaining that it is necessary to fix rules to avoid creating monstrosities.

More language-oriented activities were carried on afterwards, aiming at having the students concentrate on the more technical sides of the problem. Here they were able to practice the new vocabulary and to review the passive voice.

**Conclusive and creative activities:** At the end of the micro-unit I asked the students to discuss the ethical problems orally and to write a composition, which they did quite well.

I chose to stop here since I realized that the students were "tired" of the topic. We moved on to a different theme that we dealt with using the same strategy. This way of linking up standard English with scientific English has proved quite successful. The integration of language and topics allows the students to become proficient in a specific area without becoming "segregated" in it.

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